

REMARKS

Claims 1-3, 5, 7-11, 13, 17, 20, 23, 25, 27, 29, 30-33, 36, and 38-40 have been amended herein, claims 12 and 28 have been cancelled herein, claims 21 and 34 remain cancelled. Claims 1-11, 13-20, 22-27, 29-33, and 35-40 are currently pending.

Claim Objections

Responsive to the Examiner's objection, claim 12 has been cancelled.

Claim Rejections Based On Prior Art

Claims 1 and 2 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Pat. No. 4,053,829, issued to *Maruo*, and claims 3-11, 13-20, 22-33 and 35-40 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over *Maruo*. Applicants respectfully traverse the foregoing rejections as they may apply to the claims as amended herein for the following reasons.

Regarding the grounds for rejecting claims 1 and 2 under 35 U.S.C. § 102(b), and claims 3-11, 13-20, 22-33 and 35-40 under 35 U.S.C. § 103(a), Applicants agree that *Maruo* discloses a device for detecting direction of a magnetic field wherein a variable magnetic field is generated by a moving member; and introducing a first bridge and a second bridge, each adjacent to the moving member, the first and second bridge each comprising a first and second set of runners that are mutually perpendicular. Regarding the grounds for rejecting claims 39 and 40, however, Applicants respectfully disagree that *Maruo* discloses determining the direction of movement based on the phase shift between the output signals of the first and second bridges. In Fig. 10, *Maruo* discloses offset bridges 100a, 100b and 100c, but nowhere does *Maruo* disclose or suggest that a resulting inter-bridge signal phase difference is used in any manner. *Maruo* fails to discuss a phase difference between the two bridges, and instead, at col. 8, lines 52-64, explains that the two output terminals 103 and 104 of a *single* bridge are phase inverted.

The foregoing traversal notwithstanding, Applicants have further amended independent claims 1, 13, 20, and 33 in an effort to more clearly define and distinguish Applicants' proposed invention from the subject matter disclosed by *Maruo*. The currently pending independent claims have been re-characterized and directed toward the embodiments depicted in Applicants' Figs. 4, 6, 8 and 9 in which the bridge sensor devices are oriented in a particular manner with respect to a ring magnet.

As explained throughout Applicants' specification, an important goal of the present invention is to generate a sensor output signal (see Applicants' Figs. 5 and 7) that has a predicable phase relationship with respect to the mutual positioning of the bridge sensor devices and the rotating ring magnet. As illustrated and explained with reference to Figs. 4 and 6, the bridges are oriented with respect to the ring magnet such that a first group of runners in each bridge is aligned in parallel with a radial line from the center of the ring magnet and the second group of runners in each respective bridge is aligned perpendicular to the radial line. In this manner, and as depicted in Figs. 5 and 7, each of the bridge sensors produces a maximum and minimum peak signal when the bridge is in a direct facing position opposing the respective north and south pole faces of the ring magnet. Applicants' invention thus leverages the mutual perpendicularity of the sets of runners to provide highly accurate tracking of the sensor signal.

To more clearly incorporate the foregoing feature into Applicants' proposed invention, claim 1 has been amended to recite a method for implementing a ring-type magnetoresistive sensor comprising, in part, "generating a variable magnetic field by a *ring magnet*." (Emphasis added) Amended claim 1 further characterizes the relative positioning of the first and second bridges with the express limitation that "... the first and second bridges are oriented with respect to the ring magnet such that *the first set of runners is substantially in parallel to a radial line from the center of the ring magnet and the second set of runners is substantially perpendicular to the radial line from the center of the ring magnet*." (Emphasis added). Independent claims 13, 20 and

33 have been similarly amended to expressly recite that at least one of the bridges is oriented in the foregoing manner.

Nothing in *Maruo* or any other prior art known to Applicants discloses or suggests a magnetic sensor method or apparatus in which one or more bridges having mutually perpendicular runners are positioned with respect to a ring magnet such that one set of runners is aligned in parallel with a central radial line from the ring magnet while the other set of runners is perpendicular to the radial line as expressly recited in independent claims 1, 13, 20, and 33. Applicants thus believe claims 1, 13, 20, and 33, and all claims depending therefrom to be patentably distinct from the prior art and a Notice of Allowance to that effect is respectfully requested.

Applicants additionally note that the Attorney Docket Number has been amended so that such docket number is now "H0001822" instead of "76183.2200". Applicants request that the new docket number "H0001822" be referred to in future correspondence related to the present Application.

Applicants have diligently responded to the Office Action by pointing out with particularity how the claims clearly define and distinguish the proposed invention from the prior art, and furthermore invite the Examiner to contact Applicants at telephone number (505) 255-4536 if such communication would help to expedite the continued prosecution of the present application.

No extension of time is believed to be required in submitting this response; however, in the event that an extension of time is required, please consider that extension requested and please charge any required fee, as well as any other fees necessary to further the prosecution of this application, to the following Deposit Account.

Respectfully submitted,

A handwritten signature in black ink that reads "Kermit Lopez". The signature is fluid and cursive, with a long horizontal stroke extending from the end of the name.

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